TECHNICAL INFORMATION

Models No. ► HP1640, HP1640F, HP1641, HP1641F

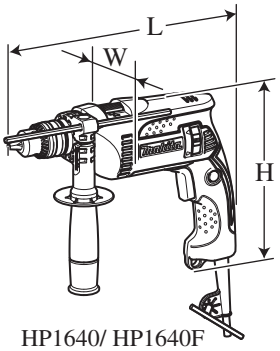
Description ► Hammer Drill 16 mm (5/8")

CONCEPT AND MAIN APPLICATIONS

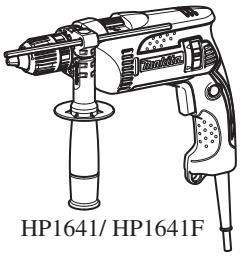
Models HP1640, HP1640F, HP1641, HP1641F have been developed as the successor models to the current HP1620 series models, featuring renewed external appearance.
Listed below are the differences among the four models.

Model No.	Drill chuck type	LED job light
HP1640	Keyed	No
HP1640F	Keyed	Yes
HP1641	Keyless	No
HP1641F	Keyless	Yes

These models are also available with plastic carrying case as "K" models; HP1640K, HP1640FK, HP1641K, HP1641FK



HP1640/ HP1640F


HP1641/ HP1641F

Dimensions: mm (")	
Length (L)	303 (11-7/8)
Width (W)	72 (2-13/16)
Height (H)	222 (8-3/4)

► Specification

Voltage (V)	Current (A)	Cycle (Hz)	Continuous Rating (W)		Max. Output (W)
			Input	Output	
110	6.5	50/60	680	380	500
110/ Taiwan	5.6	50/60	590	340	500
120	6.0	50/60	---	380	500
220	3.3	50/60	680	400	600
230	3.1	50/60	680	400	600
240	3.0	50/60	680	400	600

Specifications \ Model No.		HP1640/ HP1640F	HP1641/ HP1641F
No load speed: min^{-1}= rpm		0 - 2,800	
Impacts per min: min^{-1}= ipm		0 - 44,800	
Chuck type		Keyed chuck	Keyless chuck
Chuck capacity: mm (")		1.5 - 13 (1/16 - 1/2)	
Capacities: mm (")	Concrete	16 (5/8)	
	Steel	13 (1/2)	
	Wood	30 (1-3/16)	
Variable speed control by trigger		Yes	
Reversing switch		Yes	
LED job light		No/ Yes	No/ Yes
Protection against electric shock		Double insulation	
Power supply cord: m (ft)		2.0 (6.6)*	
Net weight: kg (lbs)		1.8 (4.0)	

*Taiwan: 5m, Argentine: 2.5m

► Standard equipment

Chuck key S-13 ..... 1 (HP1640/ HP1640F only)
Key holder ..... 1 (HP1640/ HP1640F only)
Side grip 1
Depth gauge 1
Plastic carrying case ..... 1 ("K" models only)

Note: The standard equipment for the tool shown above may differ by country.

► Optional accessories

Drill bits	Type 43 drill stand
Keyless drill chuck set	Chuck key S-13 (HP1640/ HP1640F only)
Drill chuck set	Depth gauge
Side handle set	Blow-out bulb

Repair

CAUTION: Remove the bit from the machine for safety before repair/ maintenance in accordance with the instruction manual!

[1] NECESSARY REPAIRING TOOLS

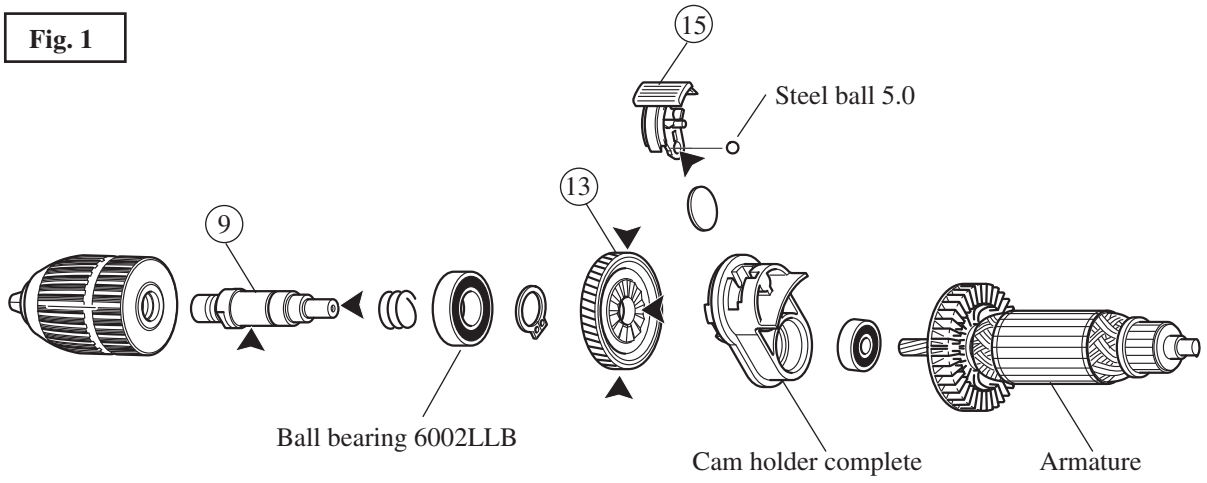
Code No.	Description	Use for
1R045	Gear extractor (large)	Removing Armature from Cam holder complete
1R139	Drill chuck extractor	Removing / Installing Drill chuck
1R165	Ring spring setting tool B	Removing Helical gear 45
1R223	Torque wrench shaft 20-90N.m	Removing / Assembling Drill chuck
1R224	Ratchet head 12.7	Use with 1R223 when removing / installing Drill chuck
1R232	Pipe 30	Supporting Helical gear 45 when installing
1R269	Bearing extractor (small)	Remove Ball bearing from Armature shaft
1R291	Retaining ring S and R pliers	Removing Retaining ring S-15 from Spindle
1R298	Hex bar 10 with square socket	Removing / Installing Drill Chuck
1R346	Center attachment for 1R045	Attachment for 1R045
———	Wrench 14	Removing damaged Drill chuck

[2] LUBRICATIONS

Apply **Makita grease N.No.2** to the following portions designated with the black triangle to protect parts and product from unusual abrasion.

Item No.	Description	Portion to lubricate	Amount
⑨	Spindle	Portion where Ball bearing 6002LLB contacts	a little
		End where Steel ball 5.0 contacts	
⑬	Helical gear 45	Gear teeth which engages Armature gear	6 g
		Cam plate which contacts the that of Cam holder complete	1.7 g
⑮	Change lever	Portion on which Steel ball 5.0 is received	a little

Fig. 1



► Repair

[3] DISASSEMBLY/ASSEMBLY

[3]-1. Drill chuck

DISASSEMBLING

1) Hold 1R298 with Drill chuck.
2) Clamp 1R139 in vise so that flats of Spindle can be fit into 14mm width groove of 1R139.
3) Turn Drill chuck counterclockwise using 1R223, 1R224 and 1R298. (**Fig. 2**)

Note: If Drill chuck does not work, clamp two flats of hexagonal part of Drill chuck in vise, then turn Spindle clockwise using wrench 14. (**Fig. 3**)

Fig. 2

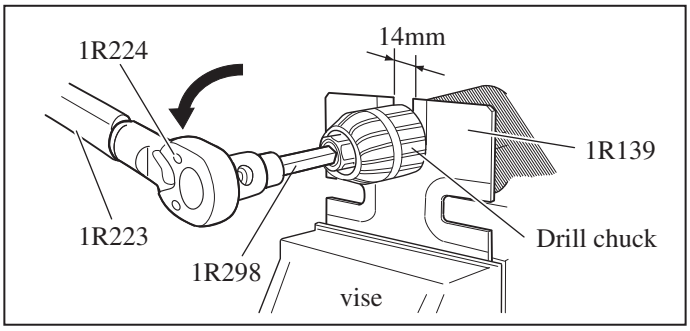
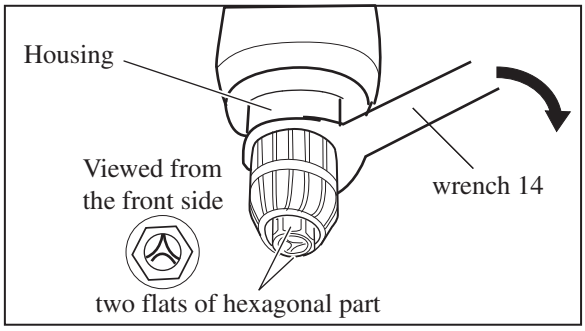


Fig. 3



ASSEMBLING

Take the disassembling step in reverse.

Note: Pre-set the fastening torque of 1R223 to 34.3 up to 44.1N.m.

[3]-2. Carbon brush, Helical gear 45, Ball bearing 6002LLB

DISASSEMBLING

1) Shift Change lever to Drill mode. (**Fig. 4**) Then separate Housing R from Housing L by removing 4x18 Tapping screws. Carbon brushes can be removed from Brush holder unit.
2) Shift Change lever to hammer drill mode. Pick up Spindle and Change lever then pivot the Spindle section along the arc illustrated in **Fig. 5**.

Fig. 4

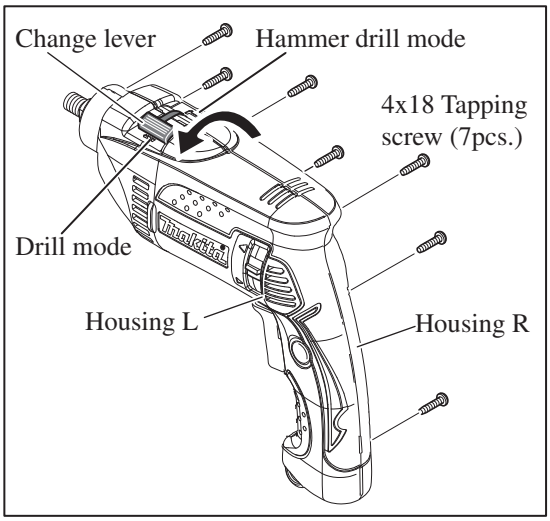
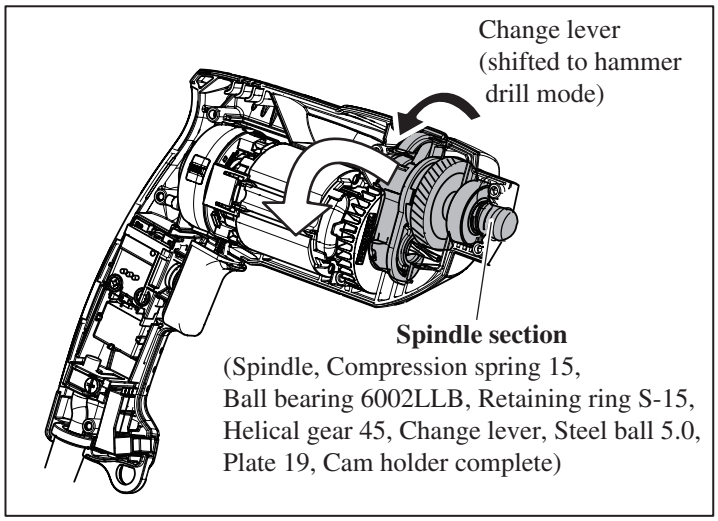


Fig. 5



3) Remove Cam holder complete from Spindle section by pulling Spindle. (**Fig. 6**)
4) Applying 1R165 to Helical gear 45, press Spindle to remove Helical gear 45. (**Fig. 7**)
5) Remove Retaining ring S-15 with 1R291. Ball bearing 6002LLB and Compression spring 15 can be removed.

Fig. 6

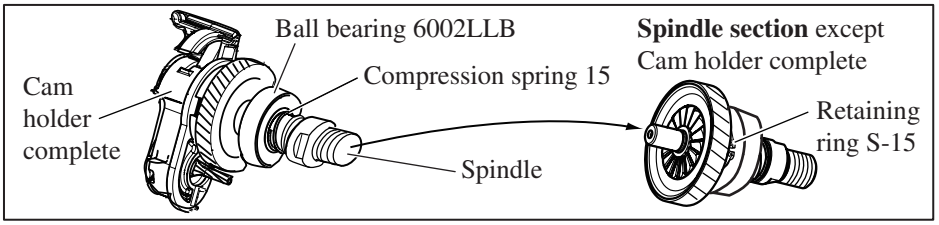
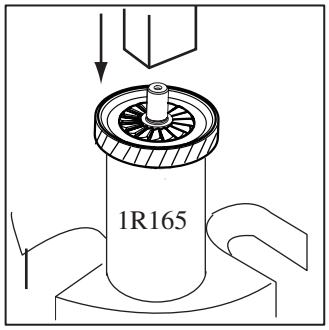


Fig. 7



► Repair

[3] DISASSEMBLY/ASSEMBLY

[3]-2. Carbon brush, Helical gear 45, Ball bearing 6002LLB (cont.)

ASSEMBLING

Take the disassembling step in reverse.
Also, refer to [3]-3. Armature DISASSEMBLING

[3]-3. Armature

DISASSEMBLING

Note: It is not required to remove Drill chuck when replacing Armature only.
1) Remove Spindle section (Refer to Fig.5) and separate Carbon brushes from Brush holder unit.
2) Remove Armature ass'y and Cam holder complete together from Housing L and Field ass'y.
Change lever, Steel ball 5.0 and Plate 19 can be removed from Cam holder complete. (**Fig. 8**)
3) Remove Armature ass'y from Cam holder complete with 1R045 and 1R346. (**Fig. 9**)
Ball bearings on drive end and commutator end can be removed with 1R269. (**Fig. 10**)

Fig. 8

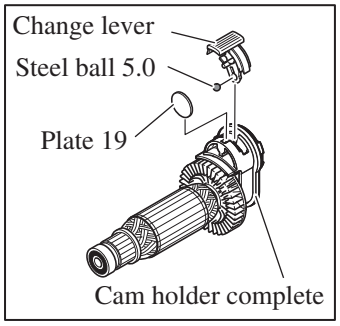


Fig. 9

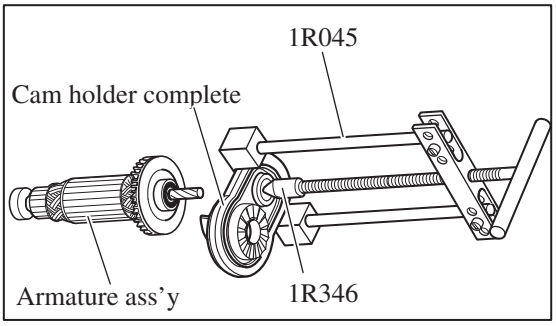
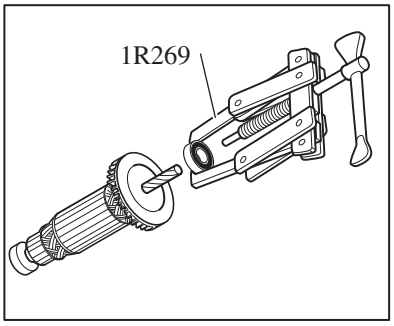


Fig. 10



ASSEMBLING

1) Mount Compression spring 15 and Ball bearing 6002LLB on Spindle.
Apply a little amount of Makita grease N No. 2 to the contact portion of Spindle and Ball bearing 6002LLB in advance. (**Fig. 1**)
And then fit Retaining ring S-15 into the groove of Spindle with 1R291.
2) Receiving Helical gear 45 with 1R232, press fit the Spindle into Helical gear 45. (**Fig. 11**)
Note: The cam portion of Helical gear 45 has to be faced to the opposite from Ball bearing 6002LLB side. (**Fig. 12**)
Do not contact the cam portion of Helical gear 45 with 1R232.

Fig. 11

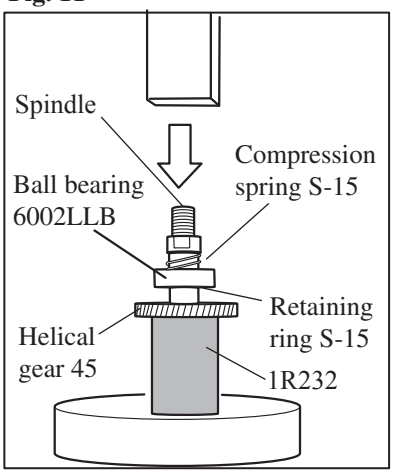
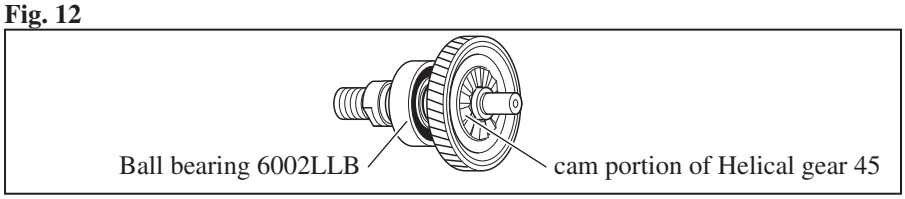


Fig. 12



3) Install Armature ass'y into Field ass'y. And assemble the remaining parts of Spindle section to Cam holder complete. Refer to **Figs. 13, 14**. Be sure to shift Change lever to Hammer drill mode.

Fig. 13

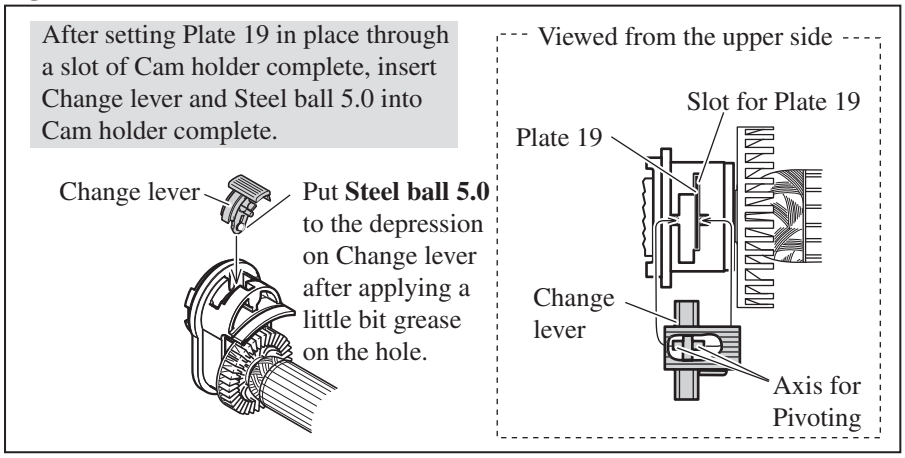
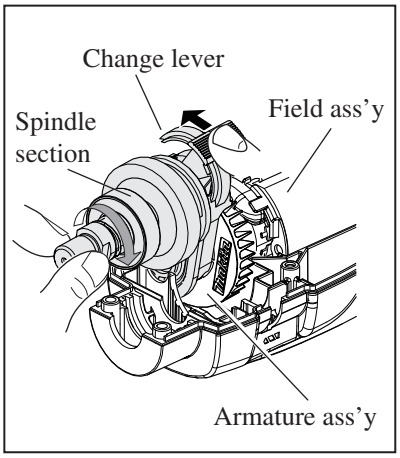


Fig. 14



► Repair

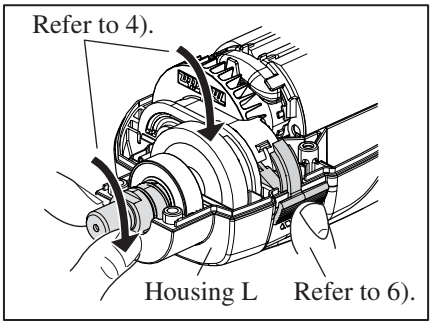
[3] DISASSEMBLY/ASSEMBLY

[3]-3. Armature (cont.)

ASSEMBLING

4) Pivot Cam holder complete on Armature shaft and install Spindle section into Housing L while revolving Spindle clockwise in order to engage their gear teeth. (**Fig. 15**)
5) Install Carbon brushes into Carbon brush holder.
6) Shift Change lever to Drill mode (**Fig. 15**). Then fix Housing R to Housing L by tightening 4x18 Tapping screws (7pcs.)

Fig. 15



[3]-4. Field ass'y, Brush holder complete

DISASSEMBLING

1) Separate Housing R and remove Carbon brushes.
2) Remove Armature ass'y and Spindle section from Field ass'y and Housing L. (**Fig. 16**)
3) Disconnect receptacles of Lead wire ends from Brush holder unit. (**Fig. 17**)
4) Remove the jaws of Brush holder unit from the protrusions of Field ass'y. (**Fig. 18**)
5) Lever up Brush holder unit from Field ass'y with slotted screwdriver as illustrated in **Fig. 19**.

Note: Joints are in the reverse side of Field ass'y, too.
Take the steps 4) and 5) in the same way.

Fig. 16

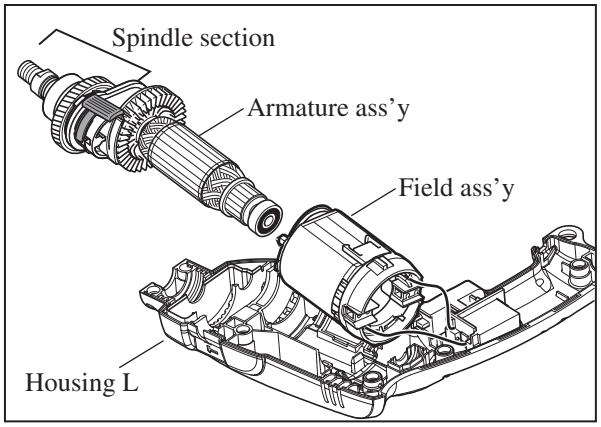


Fig. 17

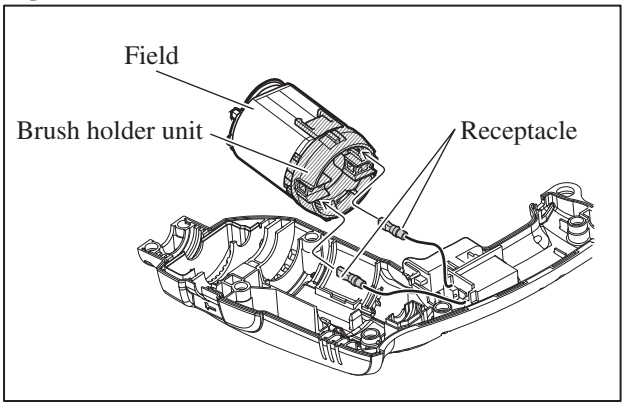


Fig. 18

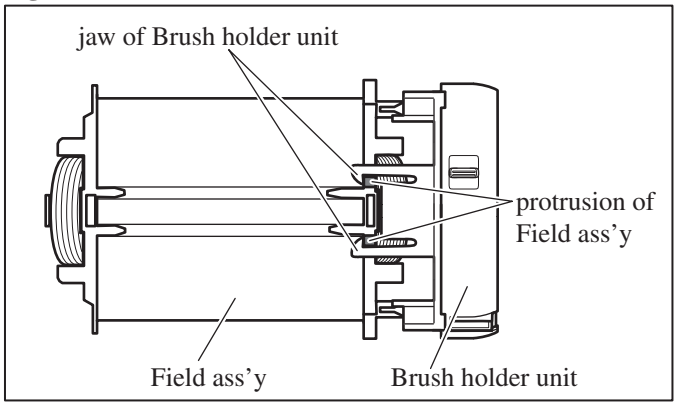
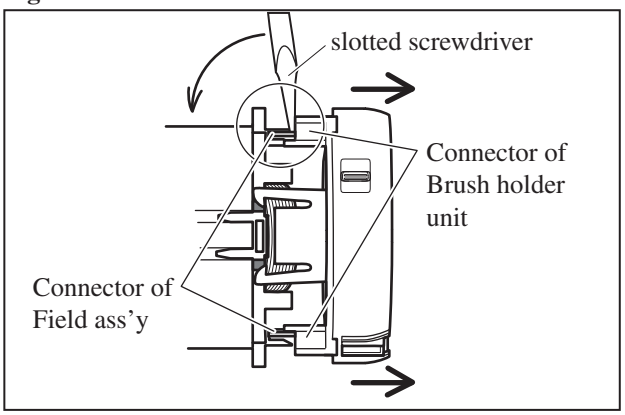


Fig. 19



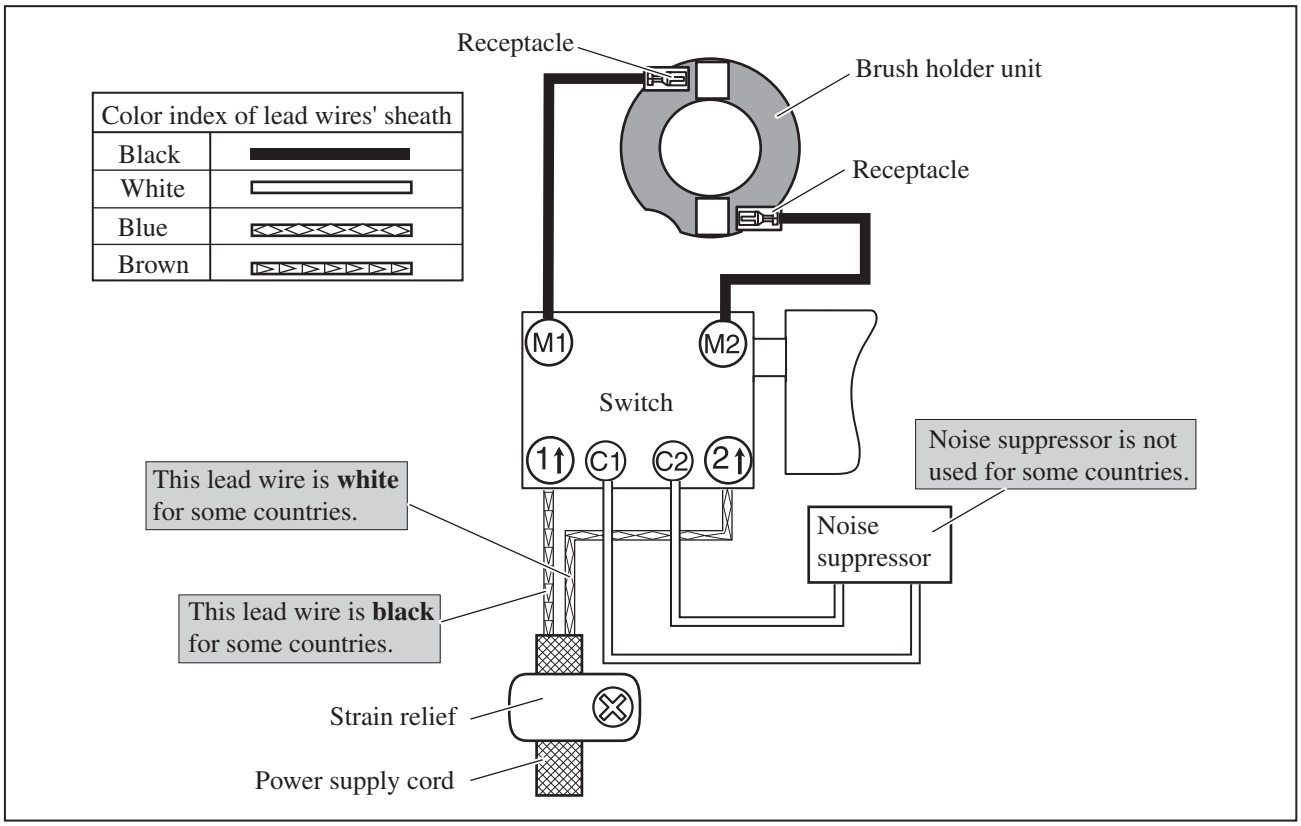
ASSEMBLING

Take the disassembling step in reverse.

Note: Brush holder unit has to be mounted to Housing L so that the recess portions are faced to Switch. Refer to **Fig. D-2A and D-2B of Wiring diagram**.

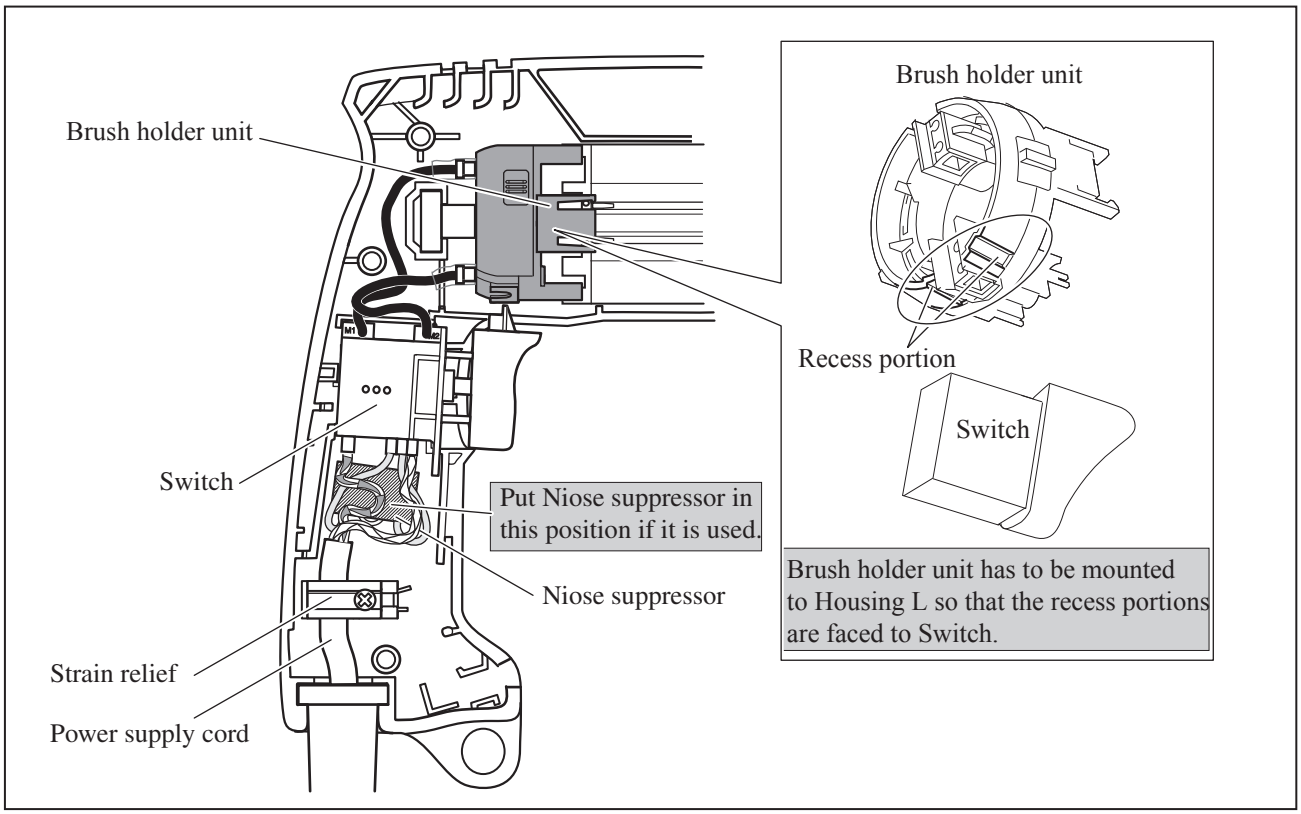
Circuit diagram of HP1641

Fig. D-1A



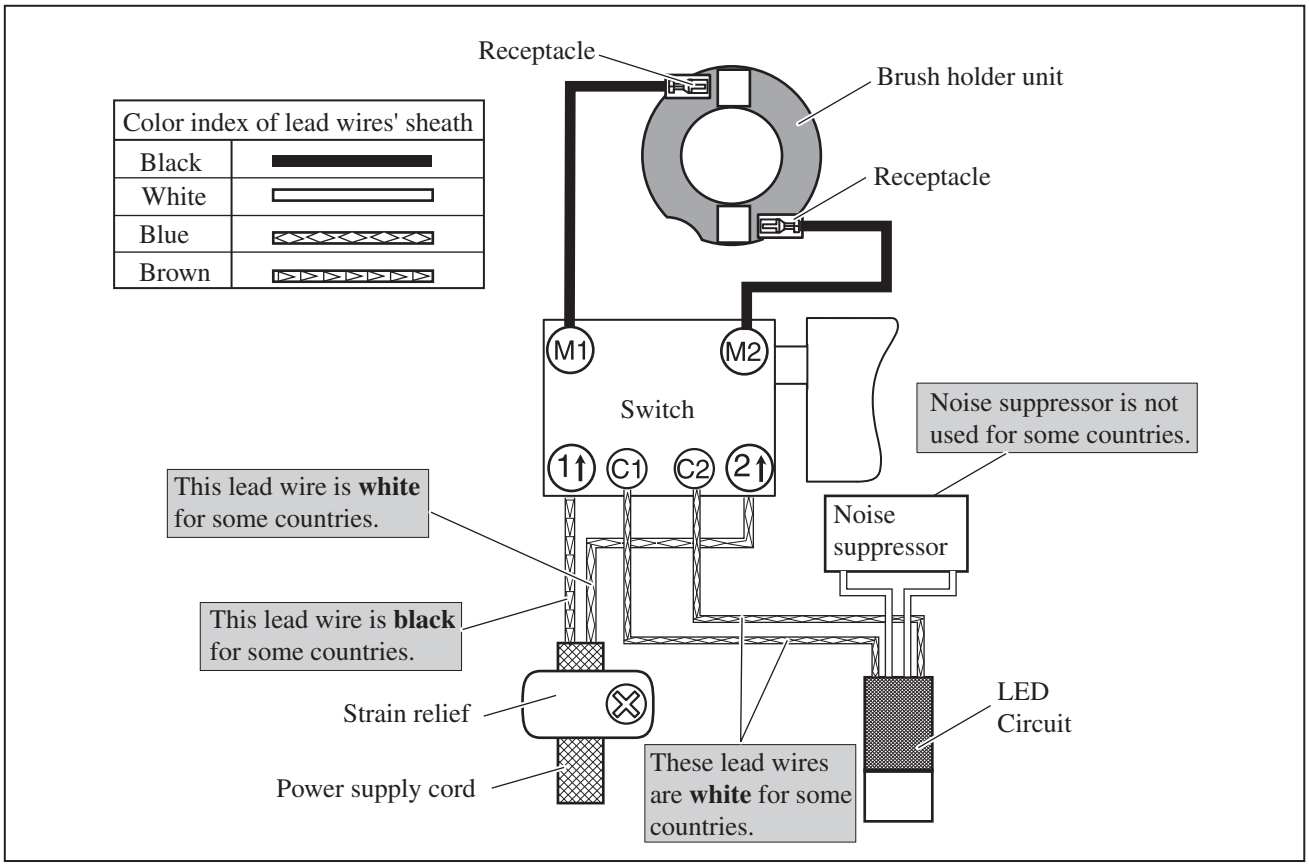
Wiring diagram of HP1641

Fig. D-2A



Circuuit diagram of HP1641F

Fig. D-1B



Wiring diagram of HP1641F

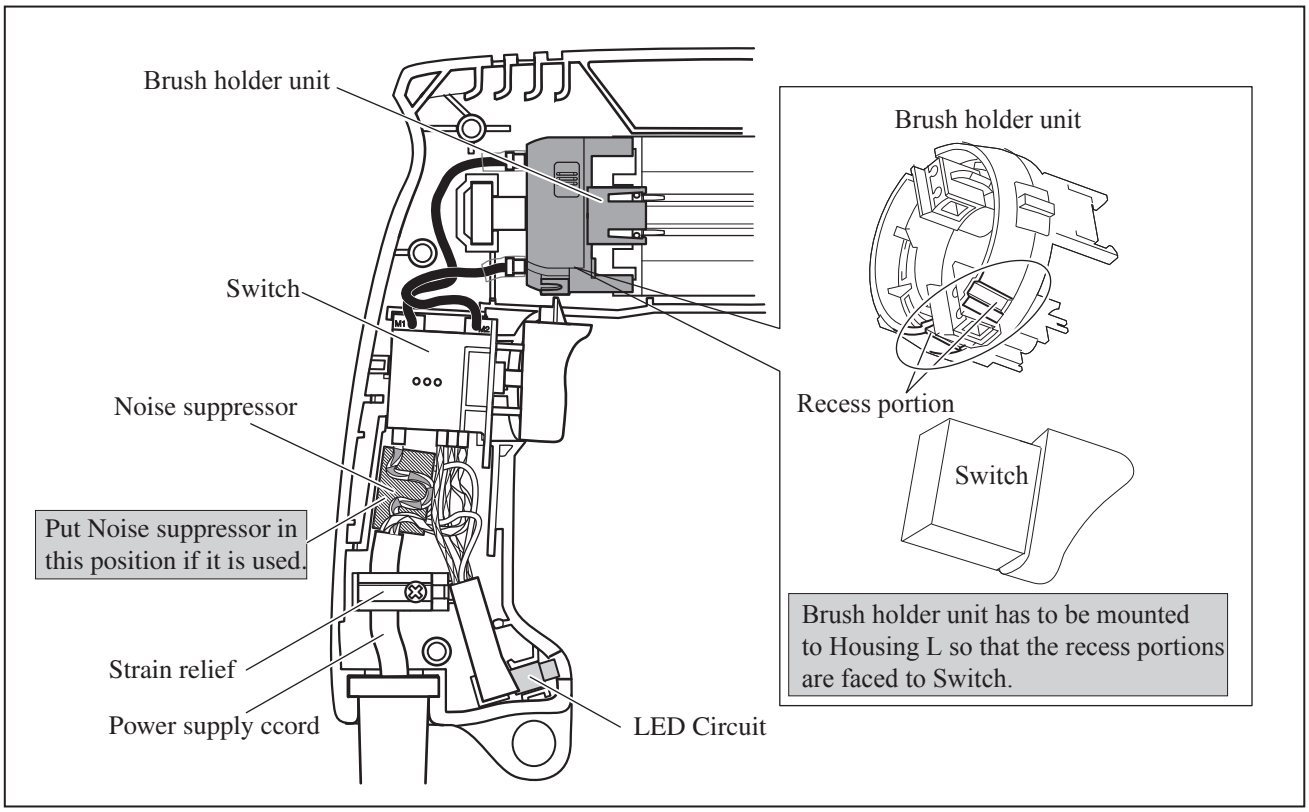



Fig. D-2B